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DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Washington 25, D. C.

1953 STATUS REPORT OF WATERFOWL

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Branch of Game Management

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This information has been hurriedly compiled both in the field and in Washington. Also, the report has not had the benefit of proof-reading or editing and should be regarded as subject to correction. The information contained in this report is for administrative use and is not for publication without permission of the contributing agency.

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INTRODUCTION

Administrators who formulate the annual waterfowl hunting regulations are guided largely in their decisions by the results of three extensive surveys: (1) a nation-wide hunting season kill survey, (2) a continental wintering population survey, and (3) a breeding population - production survey carried on from Alaska south through the Canadian Provinces and the northern States. This report aims to bring together in one place pertinent information from these surveys for use in the drafting of the 1953-54 regulations.

Because of the wide distribution of waterfowl and their migratory nature, no one section of their range can supply all the information needed. The surveys must be on a very broad basis, and therefore, the most efficient approach is a cooperative one in which State, Provincial, Federal and private conservation agencies pool their manpower and equipment. This approach is the one which has been taken in recent years; and thus the information in this report is not due to the activity of any one agency, but rather results from many agencies working together.

Since the hunting regulations are now set on the basis of four major flyways, the results of the three surveys have been organized by flyways. In the case of hunting kill survey, the kill information is for the United States only. The wintering and breeding surveys, however, are broader in scope and include areas outside the limits of the United States. The findings in these outside sections have been assigned to one or more of the major flyways based on indications from banding returns. Thus, for winter surveys, Alaska, British Columbia and western Mexico have been considered with Pacific Flyway States; eastern Mexico, with the Central Flyway; and the Maritime Provinces and the West Indies with Atlantic Flyway States. Similarly, in interpreting data from the breeding grounds, it has been assumed that birds from Alaska, Northwest Territories, British Columbia, Alberta, Saskatchewan and Montana, are important to Pacific Flyway hunters; that those areas, excepting British Columbia and Alaska, contribute materially to the Central Flyway populations; that northern Alberta, Northwest Territories, Saskatchewan, Manitoba, and western Quebec influence flights into the Mississippi Flyway; and that the Far North, and Canada from Saskatchewan to Newfoundland supply waterfowl to the Atlantic Flyway.

There is an urgent need for banding operations and research to define more clearly the flights of waterfowl to and from various breeding sections of Canada. Thus, future banding studies may show the present assumptions of distribution and migration somewhat in error and, if so, corrections then will be in order.

SCOPE OF INVESTIGATIONS AND METHODS USED

Waterfowl Kill

For a number of years the Service has recognized the need for a new kill survey method - one which would give a close approach to the actual harvest of waterfowl by species in each flyway. It succeeded in developing such a method and was able to apply it for the first time this year. It is called the waterfowl Hunter Mail Survey and involves a statistically sound sampling of waterfowl hunters whose names are obtained at the time they buy their duck stamps. The new method, in contrast to the old system of bag checks and post-season contacts which has been in use by the Service and most States in recent years, eliminates the serious errors characteristic of judgment sampling methods and removes the effects of prestige, memory, and superstition biases which are inherent in all questionnaire methods and which cause the kill reports to be greatly inflated. The new plan functions through cooperation of the Post Office Department and provides for sampling the hunters in a flyway in proportion to their occurrence in the various States. It is aimed at determining the flyway kill by species with an error not to exceed 5 percent. Results of the current year's survey are included as a part of the report on each flyway, but it should be noted that since this is the first year for this method, any comparison in kill trends must be drawn from the inflated figures of the bag-check - post season hunter contact method. An idea of the importance of sampling and bias errors in inflating kill figures can be had by comparing the results of the two methods.

The old method combining bag checks to get the average daily kill per hunter and post season hunter contacts to get the average number of hunts per season, will be discontinued. As pointed out, the results are biased on the high side and at most give only general indication of trends. The number of bag checks made by cooperating State and Service personnel and the number of post-season hunter contacts obtained in each Flyway during the past three years are shown in the following tabulation:

Flyway	1950-51	1951-52	1952-53
PACIFIC			
No. of Bag Checks	15,421	17,082	18,926
No. of Post-Season Contacts	1,761	1,467	1,592
CENTRAL			
No. of Bag Checks	10,959	26,702	22,291
No. of Post-Season Contacts	1,909	1,968	1,584
MISSISSIPPI			
No. of Bag Checks	54,668	84,783	102,175
No. Post-Season Contacts	2,624	3,142	3,154
ATLANTIC			
No. Bag Checks	19,896	24,934	35,752
No. Post-Season Contacts	2,091	787	1,112
UNITED STATES			
No. Bag Checks	100,944	153,501	179,144
No. Post-Season Contacts	8,385	7,354	7,442

Winter Survey of Waterfowl Distribution and Conditions

The annual survey to obtain information on wintering waterfowl covered most of the wintering grounds of known importance in Alaska, Canada, the United States, Mexico, and the West Indies. The survey was cooperative, as it has been in previous years, and was carried on mostly during the month of January. In Alaska, Mexico, and the West Indies, the Fish and Wildlife Service both organized and conducted surveys. In the United States the Service organized the survey but most of the actual field work was carried on by members of the 48 State Conservation Departments. In Canada, the survey was organized by the Canadian Wildlife Service and the field work was conducted by the Service and the Provinces.

As usual, the various wintering areas were covered by use of boats, cars, and aircraft, with the more important areas being covered from the air whenever possible. Information is not available as to the number of men and aircraft involved in the Alaskan and Canadian survey, but the following table lists the information for the United States, Mexico and the West Indies:

Location	Number of Observers		Number of Planes		Number of Miles Flown
	State	Federal	State	Federal	
Pacific Flyway	343	41	13	12	12,488
Central Flyway	327	44	24	11	16,943
Mississippi Flyway	738	43	11	11	14,070
Atlantic Flyway	286	31	13	17	21,865
Total for U. S.	1,694	159	61	47	65,366
Mexico	1	4		2	9,000
West Indies		2		1	3,000
Grand Total	1,695	165	61	50	77,366

Breeding Population-Production Surveys

Information derived from surveys on the breeding grounds of waterfowl constitute the best basis for forecasting the fall flights each year and obtaining an understanding of what it takes to produce waterfowl. The surveys have been expanded during recent years until they now include coverage of the more important breeding areas in Alaska and the Northwest Territories, a sampling of all portions of Alberta, Saskatchewan, Manitoba, North Dakota and South Dakota, and coverage of from a few to many of the important areas in British Columbia, the Maritime Provinces, Ontario, Quebec and approximately 25 States. Methods vary from statistically designed sampling techniques, using aerial and ground transect methods to censuses of scattered sample areas. The only data presented here, however, are those which have been taken in a comparable manner for 2 years or more, so that a trend in population can be drawn, based on quantitative information.

It will be noted in the following report that "indices to breeding populations or numbers of broods" have been calculated for some areas. The calculation of an "index" figure has been done for the purpose of adding the results of the various surveys together so that one figure can be obtained covering wider areas. In considering the "index" figures, however, it is emphasized that they do not represent total populations. Indices are based on birds seen, and it is known that when using most census methods a portion of the birds are missed. This does not detract from the value of the figures in determining relative changes in population levels from year to year, which is the important point so far as management is concerned. Every effort is being made to get all cooperators to calculate breeding population and production indices. Once this goal is achieved it will then be possible to appraise the relative importance of all sections of the breeding range and make the forecasts more accurate for the range as a whole.

PACIFIC FLYWAY

A-. Waterfowl Kill Information**1. By Bag Check and Post-Season Contact Method:**

(Figures in () are changes in percent from the previous year.)

	1950-51	1951-52	1952-53
(a) No. Hunters	329,654	360,659 (+ 9)	405,574 (+12)
(b) Av. No. Hunts	8.337	8.471 (+ 2)	9.343 (+10)
(c) Total Hunts	2,748,325	3,055,142 (+11)	3,789,277 (+24)
(d) Av. Daily Kill Index			
Ducks	2.020	2.563 (+27)	3.618 (+41)
Geese	.105	.170 (+62)	.186 (+ 9)
Coot	.033	.039 (+18)	.040 (+2.5)
(e) Av. Seasonal Kill Index			
Ducks	16.482	21.711 (+31)	33.806 (+56)
Geese	.877	1.440 (+64)	1.691 (+17)
Coot	.274	.330 (+20)	.373 (+13)
(f) Total Kill Index			
Ducks	5,433,371	7,830,268 (+44)	13,713,268 (+75)
Geese	289,184	519,349 (+79)	704,887 (+36)
Coot	90,279	119,017 (+32)	155,334 (+30)
(g) Percent Composition of Bag			
Pintail	26.9	32.8	41.7
Mallard	29.1	24.2	23.0
Baldpate	11.3	13.6	11.0
G-w. Teal	11.5	9.8	6.8
Shoveler	4.5	5.8	9.1
Other Ducks	10.5	6.2	2.5
Total Ducks	93.8	92.4	94.1
Canada Geese	2.9	3.5	3.5
Other Geese	1.8	2.7	1.3
Total Geese	4.7	6.2	4.8
Coot	1.5	1.4	1.1
(h) Percent Change in Kill			
Pintail	(+37)	(+66)	(+119)
Mallard	(+ 8)	(+31)	(+ 63)
Baldpate	(+26)	(+72)	(+ 40)
G-w. Teal	(+143)	(+27)	(+ 19)
Shoveler	(+ 9)	(+81)	(+153)

2. Waterfowl Kill Information by Mail Survey Method:

Pacific Flyway Waterfowl Bagged

	Ducks	Geese	Coots	Number of Hunters	
				Over 16	Under 16
Number Bagged	3,220,530	213,540	97,050	466,039	32,768
Average Season Bag					
Per Hunter:					
Over 16	6.78	.45	.17		
Under 16	1.88	.07	.52		

Indications are that the kills of ducks, geese and coot in the Pacific Flyway increased considerably for the third consecutive year. All of the more important duck species showed increased kills with shoveler, pintail and mallard taking the lead.

The greater kills this year were due in part to an increase in the number of hunters, in part to an increase in the number of hunts per hunter, but mostly to the increase in the average daily success.

Winter Trend Data - Pacific Flyway

1. Weather conditions during the winter survey period varied considerably in different sections of the Flyway. In the northern sector, mild conditions prevailed and waterfowl were more widely dispersed than usual. In the Pacific Flyway States, survey conditions were adverse in Washington, Oregon, Nevada, and were such as to delay the surveys in Montana and Idaho. California conditions were average to good and permitted adequate coverage, including the taking of aerial photographs in concentration areas. Weather conditions along the West Coast of Mexico were satisfactory but water levels extremely low.

2. Percent Change in Pacific Flyway (continental) Population Index
Figures for Ducks, Geese, Brant, Swan, and Coot (from 1952 to 1953
(Comparable coverage)

Area	Ducks	Geese	Brant	Swan	Coot	Total
Alaska	+ 11.0	- 2.2	-	+173.0	-	+ 10.4
Canada *	+ 12.2	+ 90.6	- 92.0	+ 9.0	+546.4	+ 18.1
Pacific Flyway						
States	+ 31.8	+ 4.4	+ 5.1	+ 42.1	+ 65.1	+ 29.8
Mexico, West						
Coast	- 48.6	- 69.5	- 13.4	-	- 63.3	- 52.9
Total	+ 10.5	+ 3.9	- 7.6	+ 41.0	+ 53.0	+ 12.2

* British Columbia and Alberta

3. Species Composition - Pacific Flyway (continental*) 1952 and 1953
(comparable coverage)

Species	Percent of Birds Identified		Percent Change 1952-1953
	1952	1953	
Pintail	26.7	23.5	- 10.1
Mallard	14.5	22.2	+ 56.2
Shoveler	7.8	5.5	- 28.2
Baldpate	7.9	9.7	+ 25.0
Scaup	7.5	5.2	- 29.9
Coot	6.8	10.2	+ 53.0
Green-winged teal	4.4	3.1	- 29.4
Snow Goose	4.2	5.1	+ 22.0
Cackling Goose	3.8	1.1	- 71.8
Scoter and Eider	3.0	2.8	- 5.0
Black Brant	2.2	2.0	- 7.6
Canada Goose	2.0	2.0	+ 3.8
White-fronted Goose	1.9	1.3	- 27.6
Bufflehead	1.5	.6	- 60.1
Gadwall	1.4	1.0	- 24.6
Goldeneye	1.2	1.3	+ 7.4
Tree Ducks	.7	tr.	- 95.5
Ruddy duck	.6	1.1	+ 72.9
Redhead	.5	.3	- 26.3
Canvasback	.4	.6	+ 48.8
Blue-winged teal	.4	.4	- 8.5
Merganser	.3	.4	+ 2.4
Whistling Swan	.2	.4	+ 44.6
Old Squaw	.1	.1	+ 63.2
Ring-necked Duck	tr.	tr.	+ 21.0
Trumpeter Swan	tr.	tr.	- 17.2
Wood duck	tr.	tr.	+ 62.4
Emperor Goose	tr.	tr.	- 70.5
Ross's Goose	tr.	.1	+
Total	100.0	100.0	+ 12.2

* Includes Alaska, British Columbia, Alberta, Pacific Flyway States and West Coast of Mexico.

Summary of Pacific Flyway Waterfowl Indices

No consistent trend up or down is shown by the waterfowl indices in the Pacific Flyway for the years 1949 through 1953.

Waterfowl - The 1953 index for waterfowl is 3 percent above the average level for the 5-year period 1949-1953; and compared to individual years, stands:

10 percent above 1952
5 percent above 1951
17 percent above 1950
10 percent below 1949

Ducks - The 1953 duck index for the Pacific Flyway is 4 percent above the average level for the 5-year period 1949-1953; and compared to individual years, stands:

8 percent above 1952
20 percent above 1951
12 percent above 1950
12 percent below 1949

Among the ducks, the indices were:

1. About the same for pintail, goldeneye, blue-winged teal, scoter, and eider.
2. Noticeably up for mallard, baldpate, ruddy and canvasback.
3. Noticeably down for shoveler, scaup, green-winged teal, bufflehead, gadwall, and redhead.

Geese - The 1953 goose index is 12 percent below the average for the 5-year period 1949-1953, and compared to individual years, stands:

4 percent above 1952
48 percent below 1951
29 percent above 1950
4 percent below 1949

Among the species of geese, the Canada remained about the same; the white-fronted geese decreased noticeably, and the snow and cackler geese increased.

Brant - The black brant index is 9 percent above the average for the 5-year period 1949-1953, and compared to individual years, stands:

8 percent below 1952
41 percent above 1951
2 percent above 1950
26 percent above 1949

Coot - The coot index is 17 percent above the average for the 5-year period 1949-1953, and compared to individual years, stands:

45 percent above 1952

2 percent below 1951

80 percent above 1950

5 percent below 1949

Breeding Ground SurveysNORTHERN ALBERTA AND NORTHWEST TERRITORIES

Weather and Water Conditions - The winter was more mild and open than usual due to the prevalence of southerly winds. The fair and dry weather continued in the spring until mid-June when frequent rains and poor flying weather developed. The season was at least a week early with water levels down but ample.

Breeding Populations - Six regions were sampled in a manner comparable to other years. On these the breeding population showed a decrease of 17 percent from 1952. These data are shown as follows:

Region	Area (Sq. Mile)	Population Index (Prs. per sq. mile)*			
		1951	1952	1953	Percent Change
Lake Claire-					
Athabaska	2,000	37,100	57,800	51,000	- 12
Slave River Park	4,025	15,496	6,762	6,038	- 11
Mackenzie Delta ¹					
(Wooded)	3,600	48,060	58,860	48,600	- 17
(Treeless)	1,600	23,300	11,280	24,000	+113
Coastal Tundra	900	5,585	6,053	9,900	+ 63
Old Crow Flats	1,970	70,034	64,518	30,535	- 52
Sub-Total	14,095	196,574	205,272	170,073	- 17
Percent Change			+ 4	- 17	

* = Total ducks recorded

2

Trends in Species in Comparable Regions

Species	Population Index (Estimated Pairs)		Percent Change	Percent Composition 1953
	1952	1953		
Mallard	31,460	20,799	- 34	12
Pintail	21,048	36,044	+ 71	21
Baldpate	9,029	14,182	+ 57	8
Shoveler	2,566	5,553	+116	3
B-w. Teal	809	1,020	+ 26	.6
Gadwall	347	510	+ 47	tr.
G-w. Teal	1,948	1,996	+ 2	1
Goldeneye	6,321	1,663	- 73	1
Redhead	2,138	3,060	+ 43	2
Canvasback	2,035	4,367	+114	3
Scaup	39,118	37,736	- 3	22
Bufflehead	1,173	1,674	+ 43	1
Ruddy	231	510	+120	tr.
Scoter	59,843	34,488	- 42	20
Eider	2,055	1,027	- 50	.6
Merganser	1,404	1,130	- 19	.6
Old Squaw	19,931	4,945	- 75	3
Total	205,272	170,073	- 17	100
Puddlers			+ 19	
Divers			- 2	
Other Ducks			- 50	

Conclusions - In view of the small decrease in breeding population in Northern Alberta and Northwest Territories this year it is anticipated that there will be a slight reduction in the fall flight from these areas as compared to last year.

ALASKA

Weather and Water Conditions - The winter in Alaska was more mild and open than usual. Polar air masses were weak. Water levels during the spring and summer were unusually low and runoff has been light. Although some shallow lakes are drying up, there is no shortage of suitable waterfowl habitat. No unseasonable storms or cold weather developed and, in general, it can be said that conditions were favorable for waterfowl production.

Breeding Population Index - The breeding population appeared to be slightly up in some areas and slightly down in others. In general, the breeding population in Alaska seemed to be about the same as last year.

Production Index - Brood production in all areas studied seemed to be about the same as last year.

Conclusions - The fall flight from Alaska will be about the same as last year.

SOUTHERN ALBERTA

Weather and Water Conditions - Southern Alberta started the 1953 waterfowl breeding season with sub-normal water conditions. Following an open dry winter, runoff was poor with the dry soil absorbing most of the available moisture. However, beginning in late April a succession of stormy periods improved the supply of surface water, the surveys during May showed only a 5 percent decrease in the number of water areas over the previous year. Continued wet and cool weather throughout the season provided more than an ample supply of water wareas for broods and delayed agricultural activities. The number of ponds per square mile recorded in May surveys during the last three years was as follows:

Year	Ponds Per Sq. Mile	Percent Change
1951	21.7	-
1952	17.1	- 19
1953	16.3	- 5

For the first time in the past seven years of waterfowl surveys, the prairies are in better condition as far as water areas are concerned in July than they were in May. In stratum A, the rise was from 8.9 to 9.3. Parkland areas followed a more normal pattern and registered a loss of about 30 percent of all water areas by July. Two devastating hail storms occurred in July and were of such extent that they have undoubtedly had some affect. One storm covered approximately 700 square miles and the other swept diagonally across the prairie about 200 miles. Hailstones and wind were such as to kill all of the birds in its path. Although the area affected by the storm is only a small part of the whole, it is large enough to be considered when determining total production from Alberta.

Breeding Population Indices - The over-all duck breeding population increased 10.4 percent over 1952 and was 40.6 percent greater than the 1950-1952 average. The 1953 coot index was 137 percent above the 1950-1952 average. Tabulation of the breeding pair indices follows:

Indices to Total Breeding Ducks

Species	Av. Index 1950-1952	1952 Index	1953 Index	Percent Change of 1953 Index from	
				Av. (a)	1952 (b)
Mallard	228,887	336,061	449,599	+ 96.43	+ 33.78
Pintail	305,865	456,787	432,980	+ 41.56	- 5.21
B-w. Teal	38,868	35,475	30,119	- 22.51	- 15.10
G-w. Teal	9,793	-	4,871	- 50.26	-
Gadwall	11,923	-	9,147	- 23.38	-
Baldpate	44,656	56,888	86,421	+ 93.53	+ 51.91
Shoveler	43,102	52,809	76,205	+ 76.80	+ 44.30
Cinn. Teal	-	-	709	-	-
Total Puddlers	683,094	938,020	1,090,051	+ 59.57	+ 16.21
Redhead	8,943	-	20,376	+127.84	-
Canvasback	10,785	-	17,814	+ 65.17	-
Scaup	54,055	64,421	61,422	+ 13.63	- 4.63
Misc. ducks*	85,987	85,987	-	-	-
Ruddy duck	10,667	-	6,800	- 36.25	-
Bufflehead and Goldeneye	5,861	-	5,231	- 10.75	-
Total Divers	85,497	64,421	111,643	+ 30.58	+ 73.30
Total Ducks	854,578	1,088,428	1,201,694	+ 40.62	+ 10.41
Coot	38,629	-	91,794	+137.63	-

* This category was used in 1952 and will be discontinued hereafter. It included all the minor species - gadwall, redhead, canvasback, ruddy, bufflehead and goldeneye.

Production Index

Aerial Production Data - 1952-1953

	Stratum A		Stratum B		Stratum C		Province	
	1952	1953	1952	1953	1952	1953	1952	1953
Survey Area								
Sq. Mile	22,088	22,088	26,100	26,100	16,112	16,112	64,300	64,300
Sample Area								
Sq. Mile	240.7	244.85	174.3	177.575	82.57	78.85	497.57	501.275
Total Broods								
Seen	1,231	763	445	514	331	100	2,007	1,377
Total Broods								
Indicated	1,231	1,095	445	588	331	226	2,007	1,909
Broods per Sq. Mile								
Indicated	5.11	4.47	2.55	3.30	4.00	2.85	4.03	3.88
Est. Number of Broods								
Indicated	112,870	98,733	66,555	86,130	64,448	45,019	243,873	230,782
Average Brood								
Size	6.81	5.47	6.81	5.71	6.81	4.80	6.81	5.51
Estimated Number of								
Ducklings	768,645	540,070	453,240	491,812	438,891	220,411	1,660,776	1,252,293

Conclusions - There is every evidence at hand to prove that the more prevalent puddle ducks had a successful hatch and it is estimated that there will be a better than average flight of mallards, pintails, baldpate and shoveler out of Alberta this fall. During the May surveys a tremendous increase in redhead was noted and at the time it was thought that these were birds on their way to other nesting grounds. On the contrary, redheads have been found nesting throughout the prairies in numbers not observed in years. Data from ground observations indicate a successful hatch and it appears that Alberta will contribute far more than it normally does to the redhead flight this fall.

Although the lesser number of ducklings per brood plus a small reduction in the number of broods has caused an estimated 25 percent reduction in the production of ducklings as compared to 1952, it should be kept in mind that 1952 was a banner year in Alberta and that the 1953 production is still well above the average for the past few years.

BRITISH COLUMBIA

Weather and Water Conditions - The winter of 1952-1953 was mild with little snow. Water levels in potholes and creeks was considerably below normal in early May but good rains since that time have brought them up to average. Weather and water conditions were favorable to a successful hatch.

Breeding Population Indices -Spring Aerial Surveys - Cariboo, Chilcotin and Prince George

	1950	1951	1952	1953
Square Miles Sampled	80.3	87.7	75.0	98.3
Ducks per Square Mile	9.1	11.3	8.5	10.4
Canada Geese (total seen)	23	34	17	47

Spring Aerial Survey - Columbia Valley

	1950	1951	1952	1953
Ducks per square mile	19.9	10.1	12.0	19.5
Canada geese per square mile	20.1	17.4	19.7	25.3
Canada geese	1,612	1,395	1,575	2,025
Swan	2	10	1	1
Mallard	773	402	445	576
Baldpate	167	83	155	103
Green-winged teal	24	-	14	-
Blue-winged teal	83	7	1	-
Canvasback	27	3	-	10
Scaup	18	9	53	3
Goldeneye	79	97	65	91
Bufflehead	2	21	9	18
Others	49	33	88	49
Unidentified	376	135	130	705
Total Ducks	1,598	790	960	1,555
Percent Change 1952 to 1953				+62 percent

Production Indices -Midsummer Counts - Cariboo Parklands

	1951		1952		1953	
	Adult	Young	Adult	Young	Adult	Young
Unidentified Ducks	-	-	102	7	-	-
Mallard	57	50	129	24	3	17
Pintail	1	-	10	9	2	4
Baldpate	63	67	28	64	11	53
Gadwall	2	16	1	-	1	8
Green-winged teal	14	37	28	32	4	30
Blue-winged teal	6	9	4	14	6	7
Shoveler	1	5	7	21	4	11
Redhead	21	67	10	72	12	69
Canvasback	9	22	35	27	8	37
Lesser scaup	174	293	212	257	138	87
Goldeneye	216	306	239	110	55	168
Bufflehead	42	36	110	68	27	99
Ruddy duck	36	16	89	19	65	19
Total Ducks	642	924	1,004	724	336	609
American Coot	369		283		310	

1953 count made 3 weeks earlier than previous years - not strictly comparable.

There was an increase in the average brood size among both the dabbling and diving ducks as compared to 1952. Dabblers increased from 6.0 ducklings per brood to 6.4 while the divers increased from 5.8 to 6.4.

Conclusions - Spring aerial surveys showed a considerable increase in the number of waterfowl, particularly Canada geese, on the breeding ground. Restricted mid-summer counts, not strictly comparable with those of last year, indicated a successful hatch. It is estimated that the number of birds moving southward from British Columbia will be about the same as last year or somewhat greater.

SASKATCHEWAN

(See page 26)

WASHINGTON

Weather and Water Conditions - Water conditions in the State have been generally good. A few areas in central Washington have less water than last year but spring rains maintained water levels fairly constant. In general, however, the spring was cold and damp and these conditions apparently had an adverse effect on nesting success.

Breeding Population - There were more breeding pairs in Washington during the nesting season this year than during any other period studied.

Production Index - The following table shows the anticipated production compared with three previous years:

Region	1950	1951	1952	1953 (anticipated)
Western Washington	41,418	35,000	31,000	25,000
Central Washington	58,672	63,062	66,910	65,000
Eastern Washington	637,336	588,000	617,400	526,000
Total	737,426	686,062	715,310	616,000

(Production 14 percent below 1952)

Conclusions - In spite of the abundant breeding population, the anticipated population at the end of the nesting season will be slightly below last year.

OREGON

Weather and Water Conditions - "Weather and water conditions have been ideal with a record amount of water available in the main breeding areas". Precipitation was heavy and temperatures much below normal during April, May, and June.

Breeding Population Indices - No totals for the State given. Breeding pairs per square mile of sample transects in eastern Oregon showed 53 pairs per square mile in 1953 and 49 in 1952, an 8 percent increase. The 1953 figure also was 16 percent above the 4-year average. Transects West of the Cascades showed a 35 percent decrease compared to 1952. "For the entire State, the breeding population remained about the same as in 1952."

Conclusions - It is estimated that Oregon will produce about the same number of birds as last year.

UTAH

Weather and Water Conditions - Mild open winter with early spring.

"Unseasonable cold weather and snow storms in the early spring were adverse to nesting geese and ducks. The late nesting season was good with little high runoff water to flood nesting areas."

Breeding Population Indices - Surveys were extended this year to give greater coverage. Over 72 square miles sampled comparatively, the ducks per square mile in 1953 increased 10.4 percent over 1952. In the State as a whole, the surveys resulted in an estimate of 36,444 pairs of breeding ducks and 1,112 pairs of breeding geese.

Conclusions - In view of the small increase in breeding populations and the favorable water conditions, it is estimated that the fall flight of ducks from Utah will be slightly larger than in 1952.

CALIFORNIA

Weather and Water Conditions - Water conditions were again nearly ideal with winter precipitation filling all lakes and impoundments. Weather was unseasonably mild during late winter which caused birds to move northward earlier than usual, but temperatures were below normal during April, May, and June. This cold weather caused nesting to be about two weeks later than normal.

CALIFORNIA (continued)Breeding Population Indices -

Species	Estimated Total Nesting Pairs				
	1949	1950	1951	1952	1953
Canada Geese	4,060	3,250	3,500	3,200	2,850
Mallard	39,326	38,843	40,543	51,580	40,380
Gadwall	6,323	7,572	8,280	5,800	6,040
Pintail	1,921	2,328	2,477	3,280	2,100
Cinnamon Teal	5,160	5,230	3,823	4,790	3,435
Green-winged Teal	200	90	130	40	10
Blue-winged Teal	365	395	170	120	80
Redhead	4,808	5,540	5,763	3,380	3,760
Shoveler	1,184	1,197	934	1,120	925
Scaup	870	910	1,150	290	235
Ruddy duck	2,552	3,581	5,323	1,510	1,950
Others	630	696	520	450	455
Total	63,339	66,342	69,042	72,360	59,370
Coots	6,920	8,036	10,154	13,790	25,150

PRODUCTION No data.

Conclusions - In view of the small reduction in breeding waterfowl plus the delay in nesting caused by cold spring weather, it is estimated that there will be a small decrease in the number of birds added to the fall flight from California.

CENTRAL FLYWAY

A. - Waterfowl Kill Information

1. By Bag Check and Post-Season Contact Method:

(Figures in () are changes in percent from the previous year.)

	1950-51	1951-52	1952-53
(a) No. Hunters	411,859	481,531 (+17)	440,334 (- 8.6)
(b) Av. No. Hunts	7.499	7.470 (0)	8.327 (+11)
(c) Total hunts	3,067,937	3,597,036 (+17)	3,666,661 (+ 2)
(d) Av. Daily Kill Index			
Ducks	1,710	1.995 (+17)	1.707 (-14)
Geese	.104	.139 (+33)	.208 (+50)
Coot	.002	.010 (+400)	.016 (+60)
(e) Av. Seasonal Kill Index			
Ducks	12.821	14.903 (+16)	14.214 (- 5)
Geese	.779	1.038 (+33)	1.738 (+67)
Coot	.016	.075 (+368)	.133 (+77)
(f) Total Kill Index			
Ducks	5,280,450	7,176,256 (+36)	6,258,907 (-13)
Geese	320,958	499,821 (+56)	762,658 (+52)
Goot	6,793	36,115 (+430)	58,564 (+62)
(g) Percent Composition of Bag			
Mallard	39.1	25.1	36.1
Pintail	9.6	31.1	13.5
Scaup	2.5	3.5	13.4
G-w. teal	8.8	6.3	6.9
Redhead	7.4	12.7	4.5
Baldpate	4.0	4.2	3.4
Other Ducks	18.5	4.5	10.7
Total Ducks	89.9	87.4	88.4
Canada Geese	2.6	4.7	4.1
Snow Geese	1.4	1.1	3.9
W-fronted Geese	.5	.3	2.6
Other Geese	tr.	tr.	.2
Total Geese	5.5	6.1	10.8
Epot	.1	.4	.8
(h) Percent Change in Kill			
Mallard	(+ 4)	(- 3)	(+ 32)
Pintail	(+180)	(+232)	(- 60)
Scaup	(+ 43)	(+ 89)	(+256)
G-w. teal	(+ 97)	(+ 3)	(+ 1)
Redhead	(+300)	(+ 98)	(- 68)
Canada geese	(- 52)	(+164)	(- 19)
Snow geese	(+ 10)	(- 36)	(+225)

2. Waterfowl Kill Information by Mail Survey Method:

Central Flyway Waterfowl Bagged

	Ducks	Geese	Coots	NUMBER of Hunters	
				Over 16	Under 16
Number Bagged	3,158,040	118,185	51,020	502,608	36,407
Average Season Bag					
Per Hunter:					
Over 16	6.19	.23	.095		
Under 16	1.28	.04	.093		

Indications are that the kill of ducks decreased slightly; whereas the kill of geese and coot increased appreciably. These conditions were primarily the result of changes in the average daily success and not to increased pressure, since the number of total hunts for the season did not change.

Winter Trend Data - Central Flyway

1. Survey conditions in the Central Flyway were generally good except for blizzard conditions in some of the northern areas the second and third days of the inventory. Drought prevailed in portions of Texas, Oklahoma, and the east coast of Mexico, which seemed to affect the number of waterfowl wintering in these areas. In the northern States, the weather during the late fall and early winter was extremely mild and there was more open water than usual.

2. Percent Change in Central Flyway (continental) Population Index Figures for Ducks, Geese, Swan, and Coot from 1952 to 1953 (comparable figures)

Area	Ducks	Geese	Swan	Coot	Total
Central Flyway States	-15.8	+ 30.0	- 7.0	- 32.4	- 12.8
Mexico - east coast	+12.8	+ 71.3	-	- 49.3	- 16.1
Mexico - central	+29.2	- 51.2	-	+190.4	+ 31.3
Total	- 8.6	+ 25.0	- 7.0	- 43.2	- 11.5

3. Species Composition - Central Flyway (continental*) 1952 and 1953
(comparable coverage)

Species	Percent of Birds Identified		Percent Change 1952-1953
	1952	1953	
Mallard	22.2	26.9	+ 1.9
Pintail	16.4	21.3	+ 8.8
Scaup	15.2	10.4	- 43.4
Redhead	15.2	12.8	- 28.8
Coot	13.8	9.3	- 43.2
Snow Goose	2.9	5.2	+ 52.1
Green-winged teal	2.6	1.3	- 56.3
Blue-winged teal	2.5	2.5	- 14.4
Baldpate	1.9	2.2	- 2.0
Canada goose	1.5	2.0	+ 16.1
Gadwall	1.3	1.5	- 4.7
Shoveler	1.2	1.2	- 11.4
Merganser	.8	1.1	+ 10.3
White-fronted goose	.6	1.0	+ 28.9
Blue goose	.6	.1	- 80.4
Canvasback	.4	.5	+ 4.0
Tree duck	.3	.2	- 51.0
Goldeneye	.3	.2	- 30.5
Ring-necked duck	.2	tr.	- 75.4
Ruddy duck	.1	.2	+ 29.7

* Includes Saskatchewan, Central Flyway States, Central Mexico, and East Coast of Mexico.

4. Summary of Population Indices

Waterfowl - The population index for waterfowl has not changed appreciably in the Central Flyway during the past 5 years. In 1953 the index was 3 percent above the 5-year average, and compared to individual years, stands:

10 percent below 1952
 19 percent above 1951
 2 percent above 1950
 10 percent above 1949

Ducks - The Central Flyway duck index is 10 percent above the average for the 5-year period 1949-1953, and compared to individual years, stands:

7 percent below 1952
 19 percent above 1951
 8 percent above 1950
 40 percent above 1949

Among duck species, the mallard, pintail, blue-winged teal, baldpate, gadwall, shoveler, and canvasback remained about the same, while scaup, redhead, green-winged teal, goldeneye and ringnecks decreased noticeably.

Geese - The population index for geese in 1953 is 21 percent below the average for the past 5 years, and compared to individual years, stands:

25 percent above 1952
 1 percent above 1951
 36 percent below 1950
 48 percent below 1949

Compared to 1952, Canada geese remained about the same, snow geese and white-fronts increased noticeably, and blue geese decreased.

Coot - The coot index for 1953 is 3 percent above the average for the period 1949-1953, and compared to individual years, stands:

43 percent below 1952
 51 percent above 1951
 2 percent below 1950
 47 percent below 1949

Breeding Ground Surveys

NORTHERN ALBERTA AND NORTHWEST TERRITORIES

(See page 11)

SOUTHERN ALBERTA

(See page 13)

SASKATCHEWAN

Weather and Water Conditions - Saskatchewan entered the 1953 waterfowl breeding season with a moisture deficiency brought about by sub-normal fall and winter precipitation. However, a series of storms with lower than normal temperatures boosted the available water supply and produced a favorable water outlook over most of the Province. The number of potholes or water areas recorded in May 1953 averaged 32.68 per square mile, indicative of a 61 percent increase over 1952 and a 63 percent increase over the average of 1950-1952 inclusive. Above normal rainfall continued through June and July.

Breeding Population Indices - The duck breeding population of southern Saskatchewan remained about the same as in 1952, an increase of 3 percent being recorded. The number of breeding pairs, however, stood 67 percent higher than the average of recent years. The coot index increased 129 percent. Detailed indices obtained from aerial surveys were as follows:

Indices to Total Breeding Pairs

Species	Av. Index 1949-1952	1952 Index	1953 Index	Percent Change of 1953 Index From	
				Av. (a)	1952 (b)
Mallard	496,074	768,103	979,136	+ 97	+ 27
Pintail	393,438	687,150	667,521	+ 69	- 3
B-w. Teal	85,530	132,705	66,722	- 28	- 98
G-w. Teal	11,404	13,975	10,616	- 7	- 31
Gadwall	39,904	54,689	38,456	- 3	- 40
Baldpate	91,232	123,570	92,340	+ 1	- 33
Shoveler	91,232	170,087	127,555	+ 39	- 33
Total Dabs.	1,208,814	1,950,279	1,982,346	+ 64	+ 2
Redhead	11,404	18,303	42,398	+271	+131
Canvasback	39,914	81,448	126,581	+219	+ 55
Scaup	62,722	114,900	104,387	+ 68	- 9
Ringneck	5,702	1,610	200	- 96	- 76
Ruddy	11,404	18,435	8,734	- 23	- 53
Goldeneye	5,702	6,399	310	- 94	- 95
Bufflehead	5,702	2,742	4,357	- 24	+ 59
Scoter	22,808	21,026	23,530	+ 3	+ 12
Total Divers	165,358	264,863	310,495	+ 87	+ 17
Total Ducks	1,374,172	2,215,142	2,292,841	+ 67	+ 3
Coot	66,143	69,948	151,733	+129	+118

In northern Saskatchewan within a 136,000 square mile area, aerial surveys indicated the following breeding population index figures:

<u>Species</u>	<u>Number</u>
Mallard	163,842
Baldpate	12,105
Pintail	9,079
G-w. Teal	2,161
Merganser	132,158
Redhead	2,161
Ringneck	1,898
Canvasback	9,079
Lesser Scaup	143,144
Bufflehead	10,112
Scoter	12,018
<u>Total</u>	<u>497,757</u>
Ducks per square mile	3.66

Although the coverage in 1952 was not strictly comparable, a density of 2.9 ducks per square mile was recorded in the same general area.

Production Index - The production of broods in Saskatchewan appears to be a substantial one again this year. Although the number of broods observed during the July transects dropped from 4.4 broods per square mile down to 1.6 per square mile this year, it appears that there is a much greater potential later production (i. e. lone drakes, lone hens and paired birds present during July transects) than in 1952. Although it is likely that only a portion of these birds will be successful, it is estimated that net production for the season will be well above the average for the past few years. It is of interest to note that the mallard hatch was very good and that the diving ducks are producing much better than last year. Pintail seems to be the species responsible for the greater part of the loss this year. Detailed production indices are presented in the following table:

Species	Index to No. of Broods		Percent Change	Index to Later Production*		Percent Change
	1952	1953		1952	1953	
Mallard	155,510	92,130	- 41	44,030	107,890	+ 145
Pintail	272,160	36,150	- 87	13,510	32,870	+ 143
B-w. Teal	17,500	7,890	- 55	18,470	35,380	+ 92
G-w. Teal	800	0	-	1,860	3,460	+ 86
Gadwall	7,580	8,120	+ 7	12,400	14,840	+ 20
Baldpate	10,520	8,850	- 16	18,000	21,080	+ 17
Shoveler	32,380	18,550	- 43	11,670	13,390	+ 15
Total Puddlers	496,400	171,790	- 65	119,990	228,910	+ 91
Redhead	420	-	-	3,220	7,970	+ 147
Canvasback	6,840	7,220	+ 6	830	15,660	+++
Scaup	1,530	3,870	+153	8,700	28,450	+ 227
Ringneck	420	-	-	-	2,990	-
Ruddy	3,150	750	- 76	7,130	14,020	+ 97
Scoter	390	-	-	-	2,540	-
Goldeneye	-	-	-	920	-	-
Bufflehead	-	-	-	-	450	-
Total Divers	12,750	11,840	- 7	20,800	72,080	+ 246
Total Ducks	509,200	183,630	- 64	140,790	300,990	+ 114
Coot	28,775	8,380	- 71	84,230	53,480	- 36

*Based on lone drakes, lone hens and paired birds observed during July transects.

Conclusions - The relative size of the fall flight coming south from Saskatchewan this fall is largely dependent on the success of the birds observed during the July transects which had not yet produced a brood. Conditions seem favorable for a sizable late production, thus it seems likely that Saskatchewan will produce a larger crop of birds than during an average year, but will probably send less south than it did last year.

NORTH DAKOTA

Weather and Water Conditions - Mild and open winter with light snowfall. Spring runoff light with subsequent lowered water levels. April and May were wet and cold causing considerable renesting. Wet conditions which continued through mid-June boosted the water supply and extended the season about three weeks. The number of water areas were up 45 percent over 1952.

Breeding Population Indices - Compared to 1952 the breeding population was up about 20 percent but was the same as the 1948-53 average. Coot indices dropped 43 percent. These indices are shown in the following tabulation:

Indices to Total Breeding Ducks

Species	Ave. Index		1953 Index	Percent Change	
	1948-1953	1952 Index		of 1953 Index from Av. (a)	1952 (b)
Mallard	195,496	163,792	202,739	+ 3.7	+ 23.7
Pintail	392,588	288,470	268,564	-31.6	- 6.9
B-w. Teal	473,874	446,151	555,851	+17.2	+ 24.5
G-w. Teal (early data incomparable)	tr.	7,334	3,218	-	- 56.1
Gadwall	88,753	84,341	120,093	+35.3	+ 42.3
Baldpate	28,101	28,114	31,888	+13.4	+ 13.4
Shoveler	152,365	92,897	114,973	=24.5	+ 23.7
Black Duck	-	-	-	-	-
Total Puddlers	1,331,177	1,111,099	1,297,326	- 2.5	+ 16.7
Redhead	40,497	29,336	40,372	- 0.3	+ 37.6
Canvasback	30,877	29,336	31,303	+ 1.4	+ 6.7
Scaup	40,887	33,003	77,234	+88.8	+134.0
Ringneck	tr.	tr.	tr.	-	-
Bufflehead	tr.	tr.	tr.	-	-
Ruddy duck	21,355	18,335	13,604	-36.2	- 25.8
Total Divers	133,616	110,010	162,513	+21.6	+ 47.7
Total Ducks	1,464,793	1,221,109	1,459,839	- 0.3	+ 19.5
Coot (1951-1953)	945	931	533	-43.5	- 42.7

Production Index

A Comparison of Brood Counts Conducted in North Dakota

Transect	1948	1949	1950	1951	1952	1953
A	59	98	105	116	77	48
B	52	109	127	140	77	33
C	35	35	43	27	36	14
D	52	49	58	84	43	10
Total	198	291	333	367	233	105
Average per Square Mile	1.6	2.4	2.8	3.0	1.9	0.9

Regarding the production survey, it is stated in the North Dakota report "it was necessary to conduct this years census approximately two weeks in advance of the suggested peak, and direct comparison between this years data and previous years is not possible..". It appears, therefore, that the reduction of approximately 50 percent in the number of broods observed may, in part, be due to the fact that the counts were made before the majority of broods were out.

Conclusions: The spring breeding population increased about 20 percent over 1952, and was about the same as the 1948-53 average. The weather was wet and cold during May and June which apparently caused heavy losses of first nests and subsequent renesting. Due to phenological differences between 1952 and 1953 it is not possible to draw conclusions as to changes in production between the two years. It is probable, however, that production will not be greater than last year and may be less. Lacking information to the contrary, it is estimated that the number of birds moving southward from North Dakota will be about the same as last year.

SOUTH DAKOTA

Weather and Water Conditions - A mild open winter prevailed but in late April and early May heavy snows and rains developed and assured a better than average supply of water. Continued cool weather and precipitation provided an abundance of water areas. The State-wide density of water areas at the period of survey increased from 6.09 areas in 1952 to 7.41 areas in 1953, an increase of 22 percent. Unfortunately, the rainy weather continued into June, flooding lowlands and creating unfavorable nesting conditions throughout the major nesting period of the mallard and pintail.

Breeding Population Indices - Based on aerial and ground surveys, the breeding population of ducks in South Dakota remained the same as in 1952. The density only changed from 13.37 to 13.65 ducks per square mile. The coot breeding population also showed no significant change, from 5.5 to 5.9 per square mile. Species indices are shown in the following tabulation:

Indices to Total Breeding Pairs

Species	1952 Index	1953 Index	Percent of Change of 1953 Index from	
			Av. (a)	1952 (b)
Mallard	75,399	65,804		- 12
Pintail	124,505	77,395		- 38
B-w. Teal	217,977	248,263		+ 14
G-w. Teal	375	375		-
Gadwall	15,329	15,703		+ 2
Baldpate	2,243	2,243		-
Shoveler	35,519	48,605		+ 37
Black Duck	-	tr.		-
Wood Duck	tr.	375		-
Cinnamon Teal	tr.	-		-
Total Puddlers	471,347	458,763		-207
Redhead	12,338	15,329		+ 24
Canvasback	3,265	1,869		- 44
Scaup	4,860	27,294		+461
Ruddy Duck	8,973	7,104		- 21
Bufflehead	-	tr.		-
Total Divers	29,436	51,596		+ 75
Total Ducks	500,783	510,359		+ 2
Coot	411,279	441,190		+

Production Index - Extensive aerial brood surveys were initiated in eastern South Dakota this year, thus there is little data from previous years for comparative purposes. A total of 34,470 square miles were sampled and an index figure of 25,500 broods calculated.

The inclement weather during the spring and early summer resulted in a duck hatch which was delayed up to as much as three weeks in the northern part of the State. This late hatch seems to have reduced the production of pintails and mallards somewhat but the production of the later nesting species is up to par or a little better. It is estimated, therefore, that the production for the 1953 season will be equal to that of 1952.

Conclusions - South Dakota s will send about the same number of birds south as it did last year, although the flight may include fewer mallards and pintails and more of the later nesting species.

WYOMING

Weather and Water Conditions - Weather in Wyoming was characterized this year by a warm spell early in the spring followed by cold, moist weather throughout much of April and May. Water conditions during the early spring were slightly below average and drought conditions prevailed in some sections of the State by early summer. By July, a critical shortage of surface water existed throughout the northwest and central portions of the State.

Breeding Population Indices - Aerial surveys during May resulted in an estimate of 13,725 breeding pairs in the State plus 16,789 birds which were classed as migratory. This was about the same number as were present during 1952. Mallards represented 62 percent of the breeding pairs with gadwall, green-winged teal and merganser comprising the remainder.

The aerial surveys also resulted in an estimate of 1,900 Canada geese, of which 670 represented the nesting population. This represented a 15 percent increase over 1952.

Production Index - No estimate on total duck production was obtained although comparisons between 1952 and 1953 indicate that production decreased considerably this year.

Goose production studies indicated that the average brood size was identical with last year, although there was a 25 percent decrease in birds produced in all areas as compared to 1952.

Conclusions - The fall flight of ducks from Wyoming this year will be considerably below last year and the flight of geese will be about 25 percent less.

NEBRASKA

Weather and Water Conditions - Mild open winter. Spring and Summer storms delayed breeding 10 days to 2 weeks; water about the same as in 1952.

Breeding Population Indices - New transects are being established. Comparison of old ones show 19.01 pairs per square mile in 1952 and 13.17 in 1953, a 31 percent decrease.

Production - Brood counts covered 37.8 square miles in the Sandhills region and as compared to last year there was a reduction of 59 percent in the number of broods. Further, the average brood size decreased to 6.2 from a 5-year average of 7.0.

Conclusions - Nebraska will contribute considerably fewer birds to the fall flight than it did in 1952.

COLORADO

Weather and Water Conditions - An early spring followed a mild dry winter. There was little accumulation of snow in the hills and the runoff was light. There was little flooding. Water levels were generally low in reservoirs, sloughs, and streams throughout the State. Intermittent potholes on the eastern plains, which in wet years furnish additional nesting habitat, were dry this year. Although not disastrous, this state-wide decrease in water has resulted in reduced production for most areas in 1953.

Breeding Population Indices - On all areas for which there was data for 1952 and 1953, it was estimated that there were 3,690 breeding pairs in 1952 and 3,995 in 1953 (an increase of about 8 percent). Goose breeding populations were about the same between the two years.

Production Index - For the same areas mentioned above, brood counts indicated that production is down about 15 percent between the two years (1952 - 17,366 young; 1953 - 14,688 young). Estimates of the goose production in Yampa Valley and Brown's Park show sizable increases in the number of goslings produced this year. Final estimates revealed 605 goslings in the two areas as compared to 200 last year, for an over-all increase of about 200 percent.

Conclusions: - Duck production was somewhat lower than last year due to a State-wide decrease in water levels and it seems likely that there will be a small decrease in the number of birds moving out of Colorado this fall. Goose production, on the other hand, is much better than last year and it appears that there will be an increase in the number of geese.

MISSISSIPPI FLYWAY

A. Waterfowl Kill Information

1. By Bag Check and Post-Season Contact Method:

(Figures in () represent changes in percent from previous year.)

	1950-51	1952-52	1952-53
(a) No. Hunters	682,593	794,898 (+ 16)	855,568 (+ 7)
(b) Av. no. Hunts	6.6	8.8 (+ 33)	10.174 (+ 15)
(c) Total Hunts	4,505,114	6,995,102 (+ 55)	8,704,548 (+ 24)
(d) Av. Daily Kill Index			
Ducks	1.28	1.41 (+ 10)	1.012 (- 28)
Geese	.03	.05 (+ 66)	.031 (- 40)
Coot	.21	.26 (+ 24)	.161 (- 39)
(e) Av. Seasonal Kill Index			
Ducks	8.54	12.32 (+44)	10.290 (- 16)
Geese	.19	.44 (+131)	.315 (- 30)
Coot	1.47	2.23 (+ 52)	1.638 (- 26)
(f) Total Kill Index			
Ducks	5,641,629	9,789,169 (+ 73)	8,808,928 (- 10)
Geese	127,801	348,165 (+172)	269,504 (- 23)
Coot	970,780	1,775,802 (+ 83)	1,401,420 (- 21)
(g) Percent Composition of Bag			
Mallard	50.6	44.7	46.8
B-w. Teal	5.3	5.4	6.0
Scaup	3.0	5.3	5.0
G-w. Teal	3.7	3.9	4.2
Pintail	5.4	4.8	4.0
Wood duck	3.0	2.2	3.9
Black duck	2.5	3.6	3.1
Other ducks	10.5	10.9	11.0
Total ducks	83.4	81.8	84.0
Canada geese	.8	1.8	1.6
Other geese	.9	1.0	1.0
Total geese	1.7	2.8	2.6
Coot	12.9	15.4	13.4
(h) Percent Change in Kill (main species)			
Mallard	(- 27)	(+ 63)	(- 8)
B-w. Teal	(- 45)	(+ 74)	(- 2)
Scaup	(- 64)	(+207)	(- 17)
G-w. Teal	(- 39)	(+ 90)	(- 5)
Pintail	(- 55)	(+ 70)	(- 26)
Wood duck	(+ 24)	(+ 27)	(- 56)
Canada geese	(- 82)	(+356)	(- 26)

2. Waterfowl Kill Information by Mail Survey Method:

Mississippi Flyway Waterfowl Bagged

	Ducks	Geese	Coots	Number Hunters	
				Over 16	Under 16
Number Bagged	5,029,950	116,010	705,870	980,665	75,556
Average Season Bag					
Per Hunter:					
Over age 16	5.02	.118	.695		
Under age 16	1.41	.019	.340		

Indications are that the kill of ducks, geese, and coot decreased from a slight to a moderate amount despite increases in the number of hunters, the average number of times hunted, and the total hunts. The drop in the average daily success was the controlling factor.

Winter Trend Data - Mississippi Flyway

1. In the northern portion of the Mississippi Flyway, weather conditions were about normal. Water areas in Minnesota and northern Michigan were mostly frozen, but temperatures were rather mild in southern Michigan and Wisconsin, permitting many water areas to remain ice-free. In the southern part of the Flyway a drought prevailed which prevented the flooding of the bottoms along the river and restricted the amount of wintering habitat. This condition made it easier to conduct a survey than in those years when the river bottoms were flooded and attracted the birds. It should be noted that the bottoms were flooded but frozen during the January 1951 survey, which forced the birds into the open. They were flooded but not frozen in January 1952, a condition which made the birds difficult to count; and the birds remained in the open this year because the bottoms did not flood. The importance of these changes in conditions as they affect the waterfowl trend figures are difficult to evaluate, but these factors should be kept in mind when analyzing the data.

2. Percent Comparison of 1952 and 1953 Duck, Goose, and Coot Population
Index Figures - Mississippi Flyway (continental) Comparable Coverage

Area	Ducks	Geese	Coot	Total
Ontario	+ 88	+ 23	-	+ 87
Mississippi Flyway States	+ 31	+ 19	- 75	+ 21
Total	+ 32	+ 19	- 75	+ 22

3. Species Composition - Mississippi Flyway (continental*) 1952 and 1953
(comparable coverage)

Species	Percent of Birds Identified		Percent Change 1952-1953
	1952	1953	
Mallard	40.3	58.3	+ 78.8
Pintail	9.4	4.5	- 40.3
Coot	8.4	1.7	- 75.1
Gadwall	6.3	3.1	- 38.6
Green-winged teal	5.7	6.2	+ 34.6
Blue Geese	5.5	6.5	+ 44.8
Canada Geese	5.3	4.3	+ 0.1
Scaup	4.9	3.9	- 0.4
Black duck	3.0	3.2	+ 33.3
Canvasback	2.4	2.0	+ 3.0
Ring-necked duck	2.0	1.2	- 28.9
Wood duck	1.8	1.6	+ 9.2
Goldeneye	1.0	.8	- 3.5
Ruddy duck	.9	.2	- 68.8
Merganser	.9	.6	- 16.9
Snow Geese	.8	.4	- 34.8
Baldpate	.7	.8	+ 46.4
Redhead	.2	.4	+134.2
Blue-winged teal	.1	.1	- 55.7
Bufflehead	.1	tr.	- 66.2
White-fronted geese	.1	.1	- 6.7
Shoveler	.1	tr.	- 23.4
Scoter and Eider	tr.	tr.	- 17.9
Whistling Swan	tr.	tr.	-
Old Squaw	.1	.1	- 1.5
Total	100.0	100.0	+ 21.9

* Manitoba, Ontario, and Mississippi Flyway States.

4. Summary of Population Indices

Waterfowl - The 1953 index for waterfowl is 14 percent above the average level for the past 5 years, and compared to individual years, stands:

22 percent above 1952
8 percent below 1951
64 percent above 1950
17 percent above 1949

Summary (continued)

- Ducks - The Mississippi Flyway duck index is 20 percent above the average level for the period 1949-1953, and compared to individual years, stands:

32 percent above 1952
 7 percent below 1951
 84 percent above 1950
 26 percent above 1949

Among the various species, scaup, canvasback, wood duck and goldeneye remained about the same. Noticeable increases were shown in mallard, green-winged teal, black duck, baldpate, and redhead, while noticeable decreases were recorded for pintail, gadwall, ringnecked duck and ruddy.

- Geese - The goose index is 6 percent above the average for the past 5 years, and compared to individual years, stands:

19 percent above 1952
 6 percent above 1951
 11 percent above 1950
 2 percent below 1949

Among the species of geese, the Canada remained about the same, blue geese increased noticeably and snow geese decreased.

- Coot - The coot index in the Mississippi Flyway is the lowest it has been in several years, being 59 percent below the average for the past 5 years, and compared to individual years, stands:

75 percent below 1952
 60 percent below 1951
 52 percent below 1950
 62 percent below 1949

BREEDING GROUND SURVEYSMANITOBA

Weather and Water Conditions: - Water levels were very low in southern Manitoba during early spring, practically eliminating perhaps 5,000 square miles of fair to good breeding habitat. Elsewhere, ample water with frequent rains permitted levels to remain constant or even gain as the season advanced. Flooding occurred in cattered localities. Rainfall during the growing season has been of near-record amount and together with a blizzard in mid-May caused the nesting season to be the latest on record. The weather had a beneficial effect in that farmers were not able to plough, thus saving many nests which are ordinarily destroyed. The moist cold weather also caused the vegetation to become much more dense than usual, which made it difficult to conduct brood surveys.

Breeding Population Indices: - Waterfowl breeding populations decreased considerably in the southwestern portion of the Province but the loss was balanced by increases in the northern portions. The details are presented in the following tables:

Waterfowl Trend Data - Manitoba

Strata	1951 Index	1952 Index	1953 Index	1953 Uncorrected Totals	Per Cent Change
A	472,780	343,180	211,610	211,610	- 38.3
B	165,880	143,300	157,300	117,260	- 18.2
C	33,810	81,150	344,910	243,469	+200.0
D	78,490	74,520	108,504	87,516	+ 17.4
Total	750,960	642,150	822,325	659,854	+ 2.6

Totals for only stratum A were corrected for hens on nests in 1952. Comparisons between 1952 and 1953 for strata B, C, and D must be made with uncorrected data only.

Total Duck Index
by Species

Manitoba 1953Strata

Species	A	B	C	D	Total
Mallard	89,088	65,594	145,898	29,185	329,767
Gadwall	5,925	2,045		542	8,512
Baldpate	11,004	2,045	7,588	4,232	24,869
Pintail	19,256	27,842	2,414	8,572	58,084
G.W. Teal			1,380	1,953	3,333
B.W. Teal	25,395	13,842		3,906	43,141
Shoveller	3,386			4,557	7,943

(continued)

Species	A	B	C	D	Total
Merganser			76,571		76,571
Redhead	6,772	5,663		4,231	16,666
Ringneck			18,281	542	18,823
Canvasback	9,734	2,045		9,874	21,653
L. Scaup	41,052	38,224	85,883	38,953	204,112
Goldeneye			4,484	108	4,592
Ruddy Duck				1,410	1,410
Bufflehead			2,414	434	2,848
Scoter					
Total	211,610	157,300	344,913	108,501	822,324

Production Indices: - Brood surveys were made only in Strata A (southwestern Manitoba) and in the Saskatchewan Delta Area in the vicinity of The Pas. In Strata A the brood index dropped from 31,104 to 8,502 and in the Saskatchewan Delta from 9,514 to 6,739 as compared to last year. It is believed, however, that these indices do not represent the magnitude of the decrease that occurred. In the first place, the season in Manitoba was extremely late this year. In 1952, the brood counts were made after the majority of the broods had hatched, while there is every indication this year that many broods may hatch following the survey period. Further, the vegetation this year was much more dense than last and it seems apparent that the aerial crews were able to see a lesser portion of the broods present this year than they were last. This is substantiated by the findings of ground crews in Strata A which found nearly as many broods this year as they did in 1952.

Conclusions: Quoting from the field report, "...it should be safe to assume that at least three-fourths as many birds will come from Manitoba in 1953 as in 1952."

S A S K A T C H E W A N

(See page 26)

N O R T H E R N A L B E R T A A N D N O R T H W E S T T E R R I T O R I E S

(See page 11)

ONTARIO

Weather and Water Conditions: - Weather and water conditions were ideal throughout most of the Province during May, June and July. No draught or excessive water conditions were experienced. Nesting and rearing conditions appeared to be ideal.

Breeding Population Indices: - In southern Ontario aerial and ground observations revealed a slight decrease in the number of breeders with the blue-winged teal becoming the most abundant species for the first time in 3 years (displacing the black duck). In northwestern Ontario, aerial surveys revealed a 60 percent increase in a 264,508 square mile area. The details of this survey are given in the following table:

Total Duck Index

Stratum C - Ontario

Species	No. Recorded	1952	Computed Total	No. Recorded	1953	Computed Total
		Per Cent			Per Cent	
Mallard	45	18.9	74,988	143	19.9	142,120
Gadwall				8	1.1	7,856
Merganser	75	31.5	124,980	428	59.5	424,932
Ring-neck				83	11.6	82,844
L. Scaup	67	28.1	111,490	40	5.6	39,994
Goldeneye	5	2.1	8,332	12	1.7	12,141
Bufflehead				4	.6	4,285
Black Duck	19	8.0	31,741			
Misc.	27	11.4	45,231			
Total	238		296,762	718	100.0	714,172

Ducks/sq.mi (uncorrected) = 1.5
Stratum area = 264,508

Sample mi² = 163.0

Ducks/sq.mi (corrected) = 2.7
Ducks/sq.mi, (uncorrected) = 2.4

Change 1952 over 1953 = +60.0%

Production Indices:Brood Records and Comparison with other years

Species	<u>1953</u>		<u>1952</u>		<u>1951</u>	
	No. Broods	Average Size	No. Broods	Average Size	No. Broods	Average Size
Black Duck	30	5.4	37	6.3	6	5.4
Mallard	19	5.8	19	5.7	2	4.5
Blue W. Teal	8	6.4	9	8.6	1	6.0
Wood Duck	10	4.0	19	5.8	2	7.6
R-N. Duck	44	5.6	58	5.3	19	5.9
Golden-eye	12	4.7	22	5.1	8	7.3
Common Merganser	2	9.0	11	6.0	4	4.2
Coot	3	5.0	2	3.0	6	3.3

From the above figures (when sufficient samples are available) it would appear that there has been little change in the last three years' brood success of any of the species of waterfowl under consideration.

Conclusions: Although there were no production surveys conducted in northwestern Ontario, with the increase in breeding population and favorable conditions it seems logical that there would be an increased flight of birds from there this fall. In southern Ontario it appears that there will be about the same number of birds as last year.

MINNESOTA

Weather and Water Conditions - Weather and water conditions during May and June were generally poor for waterfowl nesting. Heavy rains caused water levels to rise considerably in many parts of the State. The rains were often of cloudburst nature with heavy downpours in short periods of time. Undoubtedly, waterfowl nesting suffered heavy losses and delays due to adverse conditions.

Breeding Population Indices - A 27 percent increase in the duck population index was recorded, the increases being mainly in the puddle ducks. Divers decreased. The coot population remained about the same, a 2.6 percent decrease being recorded. Details of the findings in the prairie section are as follows:

Indices to Total Breeding Ducks					
Species	Av. Index 1949-1951	1952 Index	1953 Index	Percent Change of 1953 Index from	
				Av. (a)	1952 (b)
Mallard	20,413	15,956	18,543	- 9.2	+ 16.2
Pintail	4,744	4,312	5,606	+ 18.2	+ 30.0
B-w. Teal	48,156	35,794	54,769	+ 13.7	+ 53.0
G-w. Teal	216	431	431	+ 99.5	same
Gadwall	719	431	863	+ 20.0	+100.0
Baldpate	1,006	1,294	2,156	+114.3	+ 66.6
Shoveler	3,306	1,725	3,019	- 8.7	+ 75.0
Black Duck	172	-	-	-	-
Wood Duck	547	173	431	- 21.2	+149.0
Total Puddlers	79,279	60,116	85,818	+ 8.2	+ 42.8
Redhead	3,307	3,881	3,850	+ 16.4	- 0.8
Canvasback	43	86	431	+902.0	+401.1
Scaup	4,456	2,588	2,588	- 41.9	same
Ringneck	8,050	12,506	9,488	+ 17.9	- 24.1
Ruddy Duck	2,156	863	431	- 80.0	- 50.1
Goldeneye	633	431	431	- 31.9	same
Total Divers	18,645	20,787	16,819	- 9.8	- 19.1
Total Ducks	97,924	80,903	102,637	+ 4.8	+ 26.9
Coot	35,075	50,025	48,731	+ 38.9	- 2.6

Production Index

Brood counts were made on 36 water and pothole transect areas comparable to last year.

	<u>Class I</u>	<u>Class II</u>	<u>Class III</u>
<u>1952</u>			
No. of Broods	86	117	53
Percent	33.6	45.7	20.7
Average Size	7.31	7.76	6.64
<u>1953</u>			
No. of Broods	84	44	8
Percent	61.8	32.4	5.9
Average Size	7.34	7.20	6.16

In view of the larger portion of broods in Class I as compared to 1952, it appears that the brood counts this year were made earlier phenologically. A total of 232 paired adults were seen during the brood counts this year as compared to 72 last year, which indicates that there may be an additional late hatch.

Conclusions: Brood production at the time of survey was well below last year (256 as compared to 136) but additional production is indicated due to the large number of paired birds observed during the brood counts. Although the situation is not definite, it is probable that "...waterfowl production will likely be below that possible if nesting conditions during May and June had been normal."

NORTH DAKOTA

(See page 29)

W I S C O N S I N

Weather and Water Conditions: - During the first three months of 1953 the precipitation and temperatures were above normal. As a result, spring migrants moved into Wisconsin earlier than usual. Early April was cold and wet but it was warm during the last part. It is estimated that 70 percent of the spring grain had been sown by the first of May. This is about the same as in 1952, and both years are considered as being earlier than normal. Precipitation during late June and early July was below normal, but plenty of water remained for waterfowl production.

Breeding Population Indices: - The principal breeding species in Wisconsin are the blue-winged teal, mallard, black duck, wood duck and ringneck. All of these species increased in breeding pairs over 1952 with the exception of wood duck, with blue-winged teal increasing over 200 percent.

Production Indices: The following table summarizes the figures which show that the waterfowl production trend in Wisconsin was upward this year, as compared to 1951 and 1952.

Pairs/acre	Indicated:			Of Tot.: Yg/Breed -			Indicated:			Average Indicated	
	Change	:	Flocked:	ing Pair	Change	:	Brood ed	Size	Change		
				Birds-%:							
				Females:							
1951	.078	--	:	16%	:	1.46	--	:	6.5	--	
1952	.092	+18%	:	19%	:	2.58	+ 77%	:	6.6	+2%	
1953	.180	+96%	:	27%	:	2.35	- 9 %	:	7.0	+6%	

Conclusions: Wisconsin will produce considerably more ducks this year than it did in 1952.

M I C H I G A N

Weather and Water Conditions: - Water conditions were favorable in 1953, the number of water areas along the transects increasing 26 percent over 1952. Weather conditions were also favorable with May and June temperatures being somewhat above normal. Some severe weather in the form of thunderstorms and high winds occurred which caused marked fluctuations in the water levels of Great Lakes marshes. However, the net effect of these phenomena on production was not considered serious.

Breeding Population Indices: - Changes in breeding populations were determined by two methods, aerial transects and boat surveys on sample check areas. The boat surveys revealed an increase of about 60 percent in the number of birds observed per mile of travel (7.13 to 11.41) as compared to last year. The aerial surveys also revealed a large increase in breeding birds (73 percent), the details of which are represented in the following table:

Breeding Waterfowl Population Index - Lower Peninsula

Stratum	Nesting Ducks Per sq. mile		Calculated Population Index in Lower Peninsula	
	1952	1953	1952	1953
1	.474	1.18	7,634	19,006
2	.673	.60	9,254	8,250
3	.020	.20	245	2,450
Total			17,133	29,706
Percent change				+ 73

Breeding Waterfowl Species Composition - Lower Peninsula

<u>Species</u>	<u>Percent</u>
Mallard	24.8
Black Duck	24.6
Blue-winged Teal	21.3
Ringneck	9.3
Wood Duck	6.7
Merganser	1.9
Unidentified	11.4
Total	100.0

Production Indices: - Brood surveys were also conducted by boat and by plane over the same routes. Boat surveys revealed a decrease in broods per lineal mile from .70 to .51 (27 percent). Although this seems to be a fair reduction, the 1953 level is still above the average for the past five years. Further, the average brood size observed in 1953 is the highest in five years of record.

The aerial brood surveys, on the other hand, revealed a sizable increase in the number of broods in the Lower Peninsula. Brood densities per square mile increased from .073 to .162. The calculated brood index for the Lower Peninsula for the past two years is 1,176 and 2,609, and increase of 122 percent.

Conclusions: - The fall flight from Michigan will be considerably larger than in 1952.

O H I O

Weather and Water Conditions: - Weather and water conditions were in general quite favorable for waterfowl production during the spring of 1953. The Lake Erie marshes, which have periodically inundated during the past three years, causing heavy losses of nests, contained normal amounts of water throughout the early spring months. Inland lakes and streams were from normal to slightly lower than usual.

Breeding Population Indices: - Only two areas were covered in a comparable manner during both 1952 and 1953. On the Magee Marsh, the breeding population increased 4 percent and on the Resthaven area it increased 16 percent. The major breeding species are the mallard, black duck, wood duck and blue-winged teal.

Production Indices: - Brood surveys comparable to last year revealed about the same number of broods on a 10-mile stream segment in southern Ohio, on Buckeye Lake, and on Indian and Loramie Lakes. There was an increase in number broods on the Resthaven area and a considerable increase on the Magee Marsh. In all areas, however, there was a decrease in the average brood size.

Conclusions: - The total production in Ohio appears to be about the same as in 1952.

INDIANA

Weather and Water Conditions: - The weather during February and March was warmer than usual and quite dry. April was cold but the drought condition persisted. Little rain fell during the remainder of the production period and by the end of June a survey revealed that of 112 potholes which would ordinarily contain water at the time of survey, 69 percent were dry.

Breeding Population Indices: - Breeding pair counts involving seven river transects revealed that wood duck remained about the same as in 1952 while mallard decreased 73 percent and blue-winged teal increased 22 percent.

Production Indices: - Brood surveys were made on 143 miles of river transects and 14 pothole study areas. The river transects revealed a decrease in number of broods from .75 broods per lineal mile in 1952 to .66 in 1953. The pothole study areas produced 1.13 broods per square mile in 1952 and .83 in 1953. Both methods, therefore, indicate that the number of broods produced in Indiana will be somewhat less than last year. This may be partially offset, however by an increase in the average brood size. The details of the brood surveys are presented in the following table:

PRODUCTION TRENDS ON 143 LINEAR MILES OF RIVER TRANSECTS
AND 14 POTHOLE STUDY AREAS -- INDIANA

No. Broods By Age Class

Species	1952			1953			Total Broods		Per Cent Change
	I	II	III	I	II	III	1952	1953	
Mallard	3	8	2		3	3	13	6	-46
Black Duck	1		1			3	2	3	
Bl-W. Teal	1	1		2			2	2	Same
Wood Duck	57	39	8	33	49	11	104	93	-11
Lesser Scaup		1					1		
Ringneck						1		1	
H. Merganser		2			1	1	2	2	
Geet				1				1	
Fla. Gallinule				1				1	
Totals	62	51	11	37	57	19	124	109	-12

Conclusions:- The 1953 production of ducks in Indiana will be somewhat less than it was in 1952.

MISSISSIPPI FLYWAY

I O W A

Weather and Water Conditions: - Annual rainfall and marsh conditions in Iowa do not vary much or change as rapidly as they do further west, and 1953 has been an average year in this respect.

Breeding Population Indices: - Blue-winged teal, wood duck, mallard, ruddy, and redhead are the principal breeding ducks in Iowa in that order of importance. As far as was determined, the breeding population was much the same as in 1952.

Production Indices: - Report on production not received in time to be included.

Conclusions: - It seems likely that the production in Iowa will be about the same as in 1952.

ATLANTIC FLYWAY

A. Waterfowl Kill Information

1. By Bag Check and Post-Season Contact Method:

(Figures in () are percent changes from previous year.)

	1950-51	1951-52	1952-53
(a) No. Hunters	207,316	223,285 (+ 8)	268,986 (+ 20)
(b) Av. No. Hunts	7.281	7.944 (+ 9)	8.533 (+ 7)
(c) Total Hunts	1,509,467	1,784,940 (+18)	2,295,257 (+ 28)
(d) Av. Daily Kill Index			
Ducks	1.791	1.226 (-32)	1.242 (+ 1)
Geese	.099	.040 (-60)	.150 (+275)
Coot	.127	.129 (+ 1)	.132 (+ 2)
(e) Av. Seasonal Kill Index			
Ducks	13.055	10.120 (-22)	10.597 (+ 5)
Geese	.721	.320 (-55)	1.279 (+300)
Coot	.924	1.162 (+26)	1.156 (-)
(f) Total Kill Index			
Ducks	2,697,394	2,259,644 (-16)	2,852,865 (+ 26)
Geese	148,996	71,451 (-52)	344,302 (+382)
Coot	190,852	230,207 (+20)	302,878 (+ 31)
(g) Percent Composition of Bag			
Black Duck	22.7	26.6	23.2
Mallard	10.3	10.8	14.9
Scaup	8.6	10.4	7.3
Pintail	5.2	5.2	6.0
G-w. Teal	3.3	5.1	5.8
Baldpate	5.0	5.1	4.6
Wood duck	5.0	3.6	3.6
Ringneck	4.0	3.1	2.7
Canvasback	8.4	5.1	2.4
Other Ducks	15.6	13.2	10.9
Total Ducks	88.1	88.2	81.5
Canada Geese	5.0	2.8	9.8
Other Geese	tr.	tr.	tr.
Total Geese	5.0	2.8	9.8
Coot	6.9	9.0	8.7
(h) Percent Change in Kill			
Black Duck	(+ 8)	(- 1)	(+ 20)
Mallard	(+ 33)	(- 6)	(+ 77)
Scaup	(+ 9)	(+ 2)	(- 3)
Pintail	(-)	(- 13)	(+ 57)
G-w. Teal	(- 2)	(+ 24)	(+ 56)
Baldpate	(+ 92)	(- 17)	(+ 25)

(h) Percent Change in Kill (continued)

Wood duck	(+ 40)	(- 36)	(+ 36)
Canvasback	(+324)	(- 58)	(- 37)
Ringneck	(+ 16)	(- 23)	(+ 19)
Canada Geese	(+137)	(- 51)	(+380)

2. Waterfowl Kill Information by Mail Survey Method:

Atlantic Flyway Waterfowl Bagged					
	Ducks	Geese	Coot	Number of Hunters	
				Under 16	Over 16
Number Bagged	921,160	63,460	119,820	11,271	306,372
Average Season Bag					
Per Hunter:					
Over 16	3.01	.21	.37		
Under 16	1.42	.01	.61		

Moderate increases in the harvest were recorded for ducks and coots and an impressive increase in the harvest of Canada geese. In ducks and coot the increases were due primarily to an increase in the number of hunters; whereas the goose increase was due to a combination of more hunters, more times hunted, and a better daily success. Of the more important ducks species, all showed moderate or better increases excepting canvasback and scaup. Little or no change occurred in scaup, but the canvasback harvest was noticeably down.

Winter Trend Data - Atlantic Flyway

1. In the Atlantic Flyway, weather conditions were satisfactory to good during the period of survey. Temperatures were extremely mild in New Newfoundland, the Maritimes, and Quebec. Flying conditions were satisfactory in all eastern Canadian areas except in Nova Scotia, where ground counts had to be substituted. In the northern Atlantic Flyway States, temperatures were milder than usual with more open water as a result. There were some delays due to poor flying conditions but for the most part it was felt that the counts were good. In the southern Atlantic Flyway States, and in the West Indies flying conditions were satisfactory during the survey period.

2. Percent Comparison of 1952 and 1953 Duck, Goose, Brant, Swan and Coot Population Index Figures - Atlantic Flyway (continental)

Area	Ducks	Geese	Brant	Swan	Coot	Total
Canada	+142	- 1	-	-	--	+ 128
Atlantic Flyway States	+ 19	+ 62	+ 49	+ 54	+171	+ 40
West Indies	- 28	-	-	-	- 34	- 28
Total	+ 20	+ 60	+ 49	+ 54	+159	+ 38

3. Species Composition - Atlantic Flyway (continental*) 1952 and 1953
(comparable coverage)

Species	Percent of Birds Identified		Percent Change 1952 - 1953
	1952	1953	
Scaup	27.4	20.1	+ 2.0
Coot	11.0	20.5	+159.1
Black Duck	8.0	8.5	+ 48.8
Canada Geese	6.3	7.5	+ 65.6
Baldpate	5.6	3.8	- 4.8
Ring-necked Duck	5.6	4.3	+ 6.7
Pintail	4.9	4.9	+ 41.4
Canvasback	4.5	5.6	+ 71.5
Scoter and Eider	4.1	3.0	+ 3.1
Redhead	3.8	2.8	+ 2.9
Mallard	2.7	4.2	+117.8
Wood Duck	2.5	2.2	+ 23.3
American Brant	2.2	2.3	+ 48.9
Merganser	2.1	1.3	- 16.9
Green-winged Teal	2.1	.9	- 38.8
Ruddy Duck	2.0	2.4	+ 71.7
Goldeneye	1.2	1.2	+ 30.6
Blue-winged Teal	1.1	1.1	+ 31.8
Snow Geese	.9	.8	+ 27.1
Whistling Swan	.8	.8	+ 54.3
Gadwall	.6	.7	+ 56.4
Bufflehead	.4	.6	+ 92.4
Old Squaw	.1	.4	+264.5
Shoveler	.1	.1	+ 59.3
Blue Geese	tr.	tr.	- 34.9
Total	100.0	100.0	+ 38.2

* Quebec, Newfoundland, Maritimes, Atlantic Flyway States, and the West Indies.

4. Summary of Population Indices

The Atlantic Flyway has displayed a consistent trend upward in populations of waterfowl during the past 5 years.

Waterfowl - The 1953 index for waterfowl is 42 percent above the level of the 5-year period 1949-1953, and compared to individual years, stands:

38 percent above 1952
56 percent above 1951
76 percent above 1950
70 percent above 1949

Summary (continued)

Ducks - The index this year is 35 percent above the average for the past 5 years, and compared to individual years, stands:

20 percent above 1952
 41 percent above 1951
 69 percent above 1950
 74 percent above 1949

Among the duck species, scaup, baldpate, ringneck, redhead, scoter, and eider remained about the same, as compared to last year. Black duck, pintail, canvasback, mallard, wood duck, ruddy, goldeneye, and blue-winged teal increased noticeably, while green-winged teal decreased.

Geese - The 1953 index for geese was 42 percent above the average level for the period 1949-1953, and compared to individual years, stands:

60 percent above 1952
 65 percent above 1951
 58 percent above 1950
 51 percent above 1949

Both Canada and snow geese, the two important species in the Atlantic Flyway, increased noticeably.

Brant - The brant index was 48 percent above the average for the past 5 years, and compared to individual years, stands:

49 percent above 1952
 37 percent above 1951
 101 percent above 1950
 106 percent above 1949

Swan - The 1953 swan index is 40 percent above the average for the 1949-1953, period and compared to individual years, stands:

54 percent above 1952
 63 percent above 1951
 81 percent above 1950
 33 percent above 1949

Coot - The 1953 coot index is 74 percent above the average for the past 5 years, and compared to individual years, stands:

159 percent above 1952
 150 percent above 1951
 111 percent above 1950
 62 percent above 1949

BREEDING GROUND SURVEYSEASTERN CANADA (QUEBEC, LABRADOR, MARITIMES)

Weather and Water Conditions - The winter was mild throughout the region with relatively little snow. Temperatures during March and April were somewhat above normal which caused an early movement of birds northward. During May and June the temperatures were lower than last year, but were close to average for the period. Precipitation varied considerably within the region. In the western portion of the Maritimes, southern Quebec, and along the coast of Labrador, precipitation was above normal. Elsewhere, rainfall was from average to below average. During July it was warm and dry in the Maritimes and wet and cool in Quebec and Labrador.

Breeding Population Indices - Increase breeding populations were general except for the Maritime Region. All areas combined in eastern Canada showed an increase in ducks of 66 percent, but only a 27 percent increase when scoter, eider, and merganser were excluded. The important black duck and scaup increased 54 percent and 162 percent respectively, whereas the goldeneye decreased 11 percent. A comparison of 1953 with 1952 findings is shown below:

Index to Total Breeding Ducks			
Species	1952	1953	Percent Change
Black duck	146,259	225,845	+ 54
Scaup	29,782	78,129	+162
Goldeneye	96,687	86,408	- 11
Unidentified	105,929	90,289	- 15
Sub-Total	378,657	480,671	+ 27
Scoter, Eider and Merganser	287,192	623,056	+117
Grand Total	665,849	1,103,727	+ 66
Canada Geese	42,438	119,395	+181

Production Index - Brood surveys were conducted for the first time this year in Quebec and Labrador so there is no data available from last year with which to make comparisons. The distribution of the broods observed, however, would lead one to believe that the success of the early nesters was low in some areas. For example, very few broods were seen in eastern Labrador, an area where the May transects had revealed a good breeding population. This was particularly true with the Canada geese. The broods which were seen were found in a few scattered localities, while scattered pairs and groups of four, six or eight birds without broods were common in the remainder of the area. There was no evidence of renesting underway, since no single birds were seen and most of the grouped birds appeared to be moulting. An index for Quebec and Labrador of 64,435 duck broods and 15,539 goose broods was calculated. The average size of all duck broods was 5.4 ducklings while the average for those broods definitely identified as black duck was 6.2. The goose broods seen - averaged 2.6 goslings. In the Maritimes, the brood surveys were run two weeks later

than usual. Fewer broods were seen, particularly black duck, but there is evidence that the early hatch was successful and that a large portion of the increase in adult birds seen on the July transects were actually flying young. Brood counts indicated that the average brood size decreased for black ducks from 6.9 to 5.4; for goldeneye from 8.0 to 6.4 and increased for ringneck from 7.0 to 8.0.

Conclusions - It is estimated that there will be an increase in black duck, goldeneye and ringneck from the Maritimes this year. In view of the increase in breeding population and lack of comparative information to show that the brood data are not normal for the region, it is estimated that duck production from Quebec and Labrador will be somewhat better than last year. The odd distribution of Canada goose broods, however, leads to the belief that goose production in Québec and Labrador is below normal this year.

NEWFOUNDLAND

Weather and Water Conditions - The winter was mild with little snow. There was very little snow in Newfoundland at any time and most of the lakes and ponds remained open.

Production Index - Black duck broods appeared during mid-May. Black duck production showed a substantial increase while teal and ringneck increased slightly. Goldeneye remained about the same. Canada geese did not show any increase in breeding pairs but the average brood count in early June was 4.9 as against 3.9 for a similar period last year.

Conclusions - Production in Newfoundland will be somewhat better than in 1952.

SOUTHERN QUEBEC

Weather and Water Conditions - Spring was normal in southern Quebec. Water levels were high at the time of the spring breeding population survey and normal at the time of the brood survey. Conditions appeared to be favorable for nesting.

Breeding Population Index - For the most part the spring breeding population count in southern Quebec involved birds that were still in migration northward, the eider being the only duck which breeds in numbers within the area surveyed. However, the results of the breeding population count indicated an increase in population for most species of waterfowl.

Production Index - During the 1953 survey, twice the number of eider broods were observed as were seen in 1952. The ratio of "young per adult" decreased from 3.8 to 3.3, indicating that the breeding population present was somewhat less successful in the production of young.

SOUTHERN QUEBEC (continued)

Conclusions - In view of the additional number of broods seen, it is anticipated that a greater number of eiders will be produced in southern Quebec this year than were produced last year.

NORTHERN ALBERTA AND NORTHWEST TERRITORIES

(See page 11)

SASKATCHEWAN

(See page 26)

MANITOBA

(See page 40)

ONTARIO

(See page 42)

NORTHEASTERN STATES

Weather and Water Conditions - The winter was milder than usual and the spring break-up was earlier. Nesting started much earlier than normal. Heavy rains occurred after nesting had started and apparently drowned many nests. While the rains were general over the region, nesting losses seemed variable since some observers reported this condition while others did not. Where flooding did occur, all observers reported renesting, and to a substantial degree. In some areas, particularly Maine, a drought developed as the summer progressed and conditions for brood production were less favorable than a year ago.

Breeding Population Indices - In Maine the breeding population showed a slight decrease in 1953. Elsewhere in the northeastern States, observers felt that there was an ample supply of breeding pairs of black ducks and wood ducks for local production but no attempt was made to make a comparison with last year.

Production Index - A total of 148 of the sample areas which were surveyed in 1952 were covered again this year. These areas were scattered throughout the northeastern States with the exception of Pennsylvania. The production data from these areas are presented in the following table:

NORTHEASTERN STATES (continued)

Species	Total Broods		Total Young		Brood Size		Percent Change	
	1952	1953	1952	1953	1952	1953	No. Broods	Yg. Produced
Black Duck	364	370	2,477	2,311	6.9	6.3	+ 1.6	- 6.7
Wood Duck	390	436	3,306	4,127	8.6	9.5	+ 11.8	+ 24.8
Mallard	65	88	364	558	5.7	7.0	+ 20.0	+ 53.3
B-w. Teal	16	38	106	274	7.0	7.3	+137.5	+149.0
Total	835	932	6,253	7,271			+ 11.6	+ 16.2

According to ground sample areas, the number of broods and the number of young produced in the northeastern States did not change significantly over last year, although there is at least an indication that there was an increase.

Aerial surveys in New York State showed a 97 percent increase in broods over last year. Further, there was a 53 percent increase in paired birds observed during the brood survey period, indicating that there may be important production yet to come. Coastal marsh transects in New Jersey indicated a decrease of 39 percent from last year. Transects run in New Hampshire during July indicated the possibility of a major increase in production over last year. In this instance, however, the 2 sets of data are not comparable since this year's surveys were made about a month later than in 1952.

Considering both the ground and aerial surveys, it is estimated that there will be an increase in production in the northeastern States this year.

Conclusions - It is estimated that there will be from a slight to a moderate increase in the number of birds moving southward from the northeastern States this fall.

SUMMARY OF CONDITIONS

The mid-winter survey of waterfowl indicated no change in the populations of ducks, geese or brant as compared to January 1952. There was a noticeable increase in the number of coot.

In the areas supplying the Pacific Flyway with ducks, the breeding populations increased in southern Alberta, British Columbia, Washington, Colorado and Utah. There were about the same number of breeders in Saskatchewan and Oregon, and there were fewer in the Northwest Territories and California. Neither the increases nor the decreases were large, so it is probable that the breeding population for the Flyway as a whole was about the same as in 1952.

Weather and water conditions were surprisingly uniform throughout the Flyway. The winter was mild with relatively little snow. Water levels were generally low at the time of the spring break-up, which came early. In the Far North the season continued to be early as far as waterfowl were concerned, but further south the weather turned cold and wet. In most places, nesting was delayed considerably and in some places it appeared to be adversely affected. Rainfall was above normal during the production period in some areas, particularly Alberta. In Alaska the dry conditions prevailed throughout the summer.

In production of young, it seems quite definite that the breeding areas supplying the Pacific Flyway will send fewer birds southward than they did in 1952. Although an increased number are expected to be produced in British Columbia, and Utah, decreases are expected in the Northwest Territories, Alberta, Saskatchewan, Washington, Colorado and California. It is anticipated that Alaska and Oregon will produce about the same number as last year.

Much less information is available with regard to the production of geese in the Flyway. The mid-winter survey indicated that the goose population had changed very little over last year and there is nothing from the breeding ground to indicate that the breeding season was not favorable.

Over-all, when considering the relative importance of the various portions of the breeding area to the Pacific Flyway, it appears that there will be a small decrease in the number of ducks as compared to 1952, and the fall flight of geese may be about the same.

CENTRAL FLYWAY

In the Central Flyway, the mid-winter survey, which included the east coast and the central highlands of Mexico, indicated that there was little change in the populations of ducks. The goose index increased about 25 percent above 1952, but was still below the average for the past 5 years. The increase was caused primarily by white-fronted and snow geese. The coot index decreased 43 percent from last year, but is about equal to the average for the past 5 years.

Surveys to determine changes in the level of waterfowl populations once they had reached the breeding ground, revealed that there were more ducks present than in 1952. Although the increase was not great enough to be statistically significant, the calculated index figures were larger in the important areas of southern Alberta, Saskatchewan, Manitoba, North Dakota and South Dakota. Colorado also indicated an increased breeding population, while Wyoming reported about the same number, and the index for the Northwest Territories decreased.

The reports of weather and water conditions received from the various breeding areas supplying the Central Flyway were uniform in stating that the winter had been mild and open with little snow. During the spring and summer, all areas except Wyoming and Colorado reported high rainfall and cool weather which brought water levels up, but which retarded nesting and destroyed many of the early nests. In Wyoming and Colorado, there was a shortage of water to start the breeding season and this became worse as the season progressed until it became critical, particularly in the northwestern and central portions of Wyoming.

Although the brood production data are difficult to interpret, there seems little doubt but what there will be fewer young produced this year in the areas supplying the Central Flyway. When conditions are normal, the peak of brood production occurs during July and it is possible for survey crews to determine changes from year to year previous to the time that reports must be forwarded to Washington for consideration of the Regulations Committee. This year, however, the late cold spring and early summer retarded nesting to the extent that by the end of July only a portion of the brood which apparently will be produced had hatched out. Although there is considerable evidence that there will be a substantial late hatch, there is little upon which to base judgement as to its actual size. If the late hatch should fail, the low number of broods observed through the end of July would constitute a major decrease. The favorable water conditions which exist plus the large number of birds which are still nesting, indicate that nest production may be rather good, although less than last year.

Little is known with regard to the production of geese, other than that weather and water conditions were favorable as far as could be determined. In view of the increase in the wintering population of snow geese and white-fronted geese, it is estimated that there will be an increased production of these species this summer. Other species of geese will probably remain about the same as last year.

(continued)

Over-all, it is estimated that there will be a small decrease in the number of ducks in the fall flight this year. The flight of snow geese and white-fronts may be greater while the flight of Canada geese may be about the same.

Mississippi Flyway

The mid-winter survey in the Mississippi Flyway resulted in an index figure for ducks which was 32 percent above 1952. Noticeable increase were recorded for mallard, green-winged teal, black duck, baldpate and redhead; while decreases were recorded for pintail, gadwall, ringneck and ruddy. The goose index increased somewhat, the increase being due to the blue goose. The coot index decreased to the lowest point that it has been in several years.

On the breeding grounds that supply the Mississippi Flyway, field surveys during May revealed about the same picture. The counts of breeding pairs were higher in Ontario, Minnesota, North Dakota, Wisconsin, Michigan and Indiana. They were about the same or slightly higher in Manitoba, Saskatchewan, Iowa and Ohio. When considering the fact that the breeding population in this region was better than normal in 1952, this means that the start of the 1953 season found the waterfowl population in very good condition.

Upon reaching the breeding grounds the birds found weather and water conditions which were not entirely to their liking. The winter had been warm and dry with little spring runoff in most areas. Drought prevailed early in the season, particularly in southwestern Manitoba. This was followed during May, June and July by excessive rains and cold weather. Although water soon reached a favorable level, which was maintained throughout the summer in the northern areas, the period of rising levels and cold weather apparently destroyed many nests and retarded the nesting season from 10 days in some areas to as much as a month in others.

As mentioned in the Central Flyway Summary, in a normal year the peak of brood production occurs in July prior to the time that the results of the field surveys must be forwarded to Washington for consideration of the Regulations Committee. This year production had hardly begun in many of the important northern areas before termination of the field surveys on July 27. The July field work revealed an unprecedented number of lone drakes and paired birds scattered throughout the nesting areas, indicating that additional nesting was underway or could be expected. At the present writing, however, there is no means of predicting the size of the late hatch except as evidenced by the fact that weather and water conditions are favorable.

Little information is available regarding geese except that the colonies of snow and blue geese on Southampton Island in northern Hudson Bay are reported to be enjoying a successful season.

Coot production increased in Manitoba and Saskatchewan this year.

Over-all, it is anticipated that the fall flight of ducks in the Mississippi Flyway this year will show a small decrease, while the flight of geese will remain about the same, and coot will increase somewhat.

ATLANTIC FLYWAY

The annual survey during January 1953 to determine relative changes in the wintering population of waterfowl in the Atlantic Flyway revealed that the index figure for ducks has been rising rather steadily for the past five years. The index shows a 20 percent rise over last year, the increase being due to greater numbers of black duck, pintail, canvasback, mallard, wood duck and several minor species. The goose index was 60 percent above last year with both the Canada and the snow goose increasing in numbers. It is of interest to note that the brant increased again in spite of opening the season last fall for the first time in several years. There was also a major increase in the numbers of coot.

On the breeding grounds this spring much the same picture held true. In the important breeding areas of Ontario, Quebec and Labrador, the breeding pair count was up considerably. In the northeastern States, it was estimated to be about the same. Diving ducks were found in about the same, or slightly increased numbers in the Prairie Provinces.

The weather on the breeding grounds supplying the Flyway was average this year. The winter was mild with little snow. As the season progressed, there were heavy rains in the western part of the Maritimes, southern Quebec, and along the coast of Labrador. Some places in the northeastern States reported flooding and nest destruction, but in other places, particularly Maine, a drought developed as the summer progressed. In the western areas which supply the diving ducks to the Flyway, the season was cold and wet which delayed nesting considerably. Diving ducks are late nesters normally, and by the time they started to nest, water conditions were very good and the weather had improved to some extent.

Brood survey reports are almost uniformly optimistic. Although this is the first year for a brood survey in Quebec and Labrador, which means that comparative data are lacking, there is nothing to indicate that the production observed is not average for this important region. Considering the increased breeding population, it is estimated that there will be more birds produced in this area than a year ago. An increased production is also estimated for the Maritimes. In Newfoundland, Ontario, and the northeastern States, it is believed that production will be from the same to slightly better. In the western areas it is anticipated that Saskatchewan and Manitoba will send an increased number of diving ducks to the Flyway this fall and that the Northwest Territories should send at least as many as last year.

Regarding geese, the breeding ground surveys in Quebec and Labrador sample the majority of the Canada goose breeding ground which supply the Flyway. Although comparative production data are lacking from last year, the distribution of broods observed during July leads to the belief that production was largely a failure in some rather sizeable areas. Since there was no evidence that renesting was underway, it is anticipated that in spite of the increased breeding population there will not be an increased number of Canada geese in the flight this fall.

Over-all, it is estimated that the fall flight of both Dabblers and Divers will be somewhat greater than last year in the Atlantic Flyway. It is estimated that the numbers of Canada geese will remain about the same.